

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. **(Previously Presented)** An apparatus for detecting vulnerable plaque within a lumen defined by an intraluminal wall, the apparatus comprising:

a pre-formed probe stored within a cannula that defines an axis, the probe [that], when deployed from the cannula, resiliently [assumes] assuming a preferred shape having a natural bend that urges the probe outward, away from the axis of the cannula, the probe having

an optical fiber extending [therethrough] through the pre-formed probe, and

an atraumatic light-coupler in optical communication with the optical fiber, the coupler being disposed to atraumatically contact the intraluminal wall when the probe resiliently assumes the preferred shape;

a light source in optical communication with the fiber for illuminating the wall; and

a detector in optical communication with the fiber for detecting light from within the wall.
2. **(Previously presented)** The apparatus of claim 1, wherein the probe further comprises a jacket enclosing the fiber.

3. **(Previously presented)** The apparatus of claim 2, wherein the jacket comprises a coil-wire wound into a coil-wire jacket.
4. **(Previously presented)** The apparatus of claim 3, wherein the jacket comprises a coil-wire having a variable diameter.
5. **(Previously presented)** The apparatus of claim 1, wherein the probe comprises a plurality of optical fibers.
6. **(Cancelled)**
7. **(Previously Presented)** The apparatus of claim 1, wherein the preferred shape comprises a bow.
8. **(Previously Presented)** The apparatus of claim 1, wherein the preferred shape comprises an arc.
9. **(Previously Presented)** The apparatus of claim 1, wherein the preferred shape comprises a portion of a catenary curve.
10. **(Previously presented)** The apparatus of claim 1, wherein theatraumatic coupler is disposed at a distal tip of the probe.
11. **(Previously presented)** The apparatus of claim 10, wherein theatraumatic coupler comprises a lens attached to the distal tip of the optical fiber.
12. **(Previously presented)** The apparatus of claim 10, wherein theatraumatic coupler is integral with the optical fiber.
13. **(Previously presented)** The apparatus of claim 12, wherein theatraumatic coupler comprises a distal tip of the optical fiber.
- 14-19. **(Cancelled)**

20. **(Previously presented)** The apparatus of claim 1, wherein the light source comprises a near infrared light source.
21. **(Previously presented)** The apparatus of claim 1, further comprising a processor in data communication with the detector, the processor being configured to identify a vulnerable plaque on the basis of a signal provided by the detector.

22-42. (Cancelled)

43. **(Original)** A method of detecting vulnerable plaque within an intraluminal wall, the method comprising:

inserting a cannula into a lumen, the cannula defining an axis and having a pre-formed probe contained therein, the pre-formed probe having a resiliently assumed preferred shape having a natural bend that urges the pre-formed probe away from the axis of the cannula;

following entry into the lumen, deploying the pre-formed probe from the cannula, thereby permitting the pre-formed probe to assume the preferred shape having the natural bend, thereby causing contact between an atraumatic light coupler on the pre-formed probe and the intraluminal wall;

[placing an atraumatic light coupler in contact with the intraluminal wall;]

passing light through the intraluminal wall by way of the atraumatic light coupler;

receiving light from within the intraluminal wall by way of the atraumatic coupler; and

providing the received light to a processor for analysis to identify the presence of a vulnerable plaque

whereby light passes between the atraumatic coupler and the intraluminal wall without being scattered by blood therebetween.

44. **(Original)** The method of claim 43, wherein placing an atraumatic light coupler in contact with the intraluminal wall comprises placing a distal end of a probe in contact with the intraluminal wall.
45. **(Cancelled)**
46. **(Previously Presented)** An apparatus for detecting vulnerable plaque within a lumen defined by an intraluminal wall, the apparatus comprising:
- [a probe that resiliently assumes a preferred s-shape, the probe having]
- a pre-formed probe stored within a cannula that defines an axis, the probe, when deployed from the cannula, resiliently assuming a preferred shape having a natural bend that urges the probe outward away from the axis of the cannula;
- an optical fiber extending through the pre-formed probe;
- [an optical fiber extending therethrough, and]
- means for atraumatically contacting the intraluminal wall, the contacting means being in optical communication with the optical fiber and being disposed to contact the intraluminal wall when the probe assumes the preferred shape;
- a light source in optical communication with the fiber for illuminating the wall; and
- a detector in optical communication with the fiber for detecting light from within the wall.
47. **(Previously presented)** The apparatus of claim 46, wherein the means for atraumatically contacting the intraluminal wall comprises a rounded surface at a distal tip of the probe.
48. **(Previously presented)** The apparatus of claim 47, wherein the rounded surface comprises a surface of a lens attached to the fiber.

49. **(Previously presented)** The apparatus of claim 48, wherein the means for providing optical communication comprises the lens.
50. **(Previously presented)** The apparatus of claim 47, wherein the rounded surface comprises a surface of the fiber.
51. **(Previously Presented)** The apparatus of claim 46, wherein the means for providing optical communication comprises the fiber.

52-55. (Cancelled)

56. **(Previously Presented)** The apparatus of claim 1, wherein theatraumatic light-coupler is in contact with the optical fiber.
57. **(Previously Presented)** The apparatus of claim 1, wherein a surface of theatraumatic light coupler is in contact with the optical fiber.
58. **(Previously Presented)** The apparatus of claim 1, wherein theatraumatic light-coupler is disposed at a distal tip of the probe.
59. **(Previously Presented)** The apparatus of claim 1, wherein theatraumatic light coupler is disposed along a side of the probe.
60. **(Previously Presented)** The apparatus of claim 1, wherein theatraumatic light coupler contacts the wall at a point at which light exits theatraumatic light-coupler and enters the wall.
61. **(Previously Presented)** The apparatus of claim 1,
wherein theatraumatic light coupler contacts the wall at a point at which light exits theatraumatic light-coupler and enters the wall, and
wherein a surface of theatraumatic light coupler is in contact with the optical fiber.